TENNESSEE DEPARTMENT OF EDUCATION
FIRST TO THE TOP

Medical Detectives (PLTW)

Primary Career Cluster:	Science, Technology, Engineering, and Mathematics (STEM)
Consultant:	Bethany King Wilkes, (615) 532-2844, Bethany.Wilkes@tn.gov
Course Code:	TBD
Prerequisite(s):	None
Credit:	N/A
Grade Level:	8
Graduation Requirement:	N/A
Coursework and Sequence:	This is the first course in the *Project Lead the Way (PLTW)* middle school sequence of coursework.
Necessary Equipment:	Visit www.pltw.org for more information.
Aligned Student Organization(s):	Technology Student Association (TSA):http://www.tntsa.org Amanda Hodges, (615) 532-6270, Amanda.Hodges@tn.gov
Coordinating Work-Based Learning:	N/A
Available Student Industry Certifications:	N/A
Dual Credit or Dual Enrollment Opportunities:	N/A
Teacher Endorsement(s):	001, 013, 014, 015, 016, 017, 018, 047, 070, 078, 081, 101, 210, 211, 212, 213, 214, 230, 231, 232, 233, 400, 401, 402,413, 414, 415, 416, 417, 418, 440, 470, 477
Required Teacher Certifications/Training:	*Project Lead the Way* training is required
Teacher Resources:	http://www.tn.gov/education/cte/doc/STEMResourceList.pdf

Course Description

This is a course in the series of *Project Lead the Way (PLTW)* curriculum. For more information, visit the PLTW website at http://www.pltw.org/.

Program of Study Application

These courses build knowledge and skills related to the following career clusters:

1) Architecture & Construction
2) Information Technology (IT)
3) Manufacturing
4) Science, Technology, Engineering & Mathematics (STEM)
5) Transportation, Distribution, & Logistics

Course Standards

The course standards outlined below are the copyrighted property of *Project Lead the Way*. Teachers must participate in *Project Lead the Way* training in order to be able to teach this course.

Lesson 8.1 What is a Medical Detective? (13 days)

Understandings

1) Patient health can be evaluated in a variety of ways, including collecting a patient's medical history and testing vital signs.
2) An epidemic is an infectious disease that spreads rapidly and sickens a large number of people.
3) Medical professionals use a sequential, logical process to evaluate, diagnose, and treat patients.
4) A variety of health care professionals and scientists investigate medical mysteries.

Knowledge and Skills

It is expected that students will:

- Measure vital signs including heart rate, blood pressure, and temperature.
- Demonstrate the use of technology as an important tool in the Biomedical Sciences.
- Explain the different ways a virus spreads through a population.
- Describe the spread of a viral illness after inoculation is introduced.
- Evaluate patient case files to diagnose the pathogen responsible for the patient's mystery illness.
- Describe the steps that a medical professional will take to diagnose and treat a patient.
- Provide examples how medical professionals contribute to the health and wellness of individuals.

Lesson 8.2 Mysteries of the Human Body Systems (17 days)

Understandings

1) The nervous system collects and interprets input from the outside world using specialized receptors.
2) The brain is a complex organ that is organized into specialized regions.
3) The expression of a genetic trait through families highlights the varying patterns of genetic inheritance.
4) The unique sequence of a person's DNA can be utilized for a variety of purposes including testing for a genetic disease.
5) A mutation in the sequence of nucleotides in DNA may cause a genetic disease.

Knowledge and Skills
It is expected that students will:

- Describe how the brain collects and interprets input.
- Compare and contrast the senses of hearing and sight, taste and smell and how they are collected and processed by the human body.
- Identify major regions of the human brain.
- Dissect a sheep's brain, accurately identifying and describing the function of the specified structures.
- Compare and contrast the brains of a human and sheep.
- Evaluate patient family history as part of a medical exam and create a pedigree.
- Determine the probability of a child inheriting a genetic disease.
- Use appropriate laboratory methods to isolate DNA from cheek cells.
- Analyze how changes in the huntingtin gene affect the resulting protein and nerve cell function.

Lesson 8.3 Murder Mystery (15 days)

Understandings

1) Body temperature can be used as one way to determine the approximate time of 1.death.
2) An autopsy can provide clues to the circumstances surrounding a mysterious 2.death.
3) Human DNA is a unique code of over three billion base pairs that provides a 3.genetic blueprint of an individual.

Knowledge and Skills
It is expected that students will:

- Know how to use patient and ambient temperature to identify the time of death.
- Know how to use the time of death information to identify suspects.
- List the steps of an autopsy.
- Analyze a portion of an autopsy report to determine the cause of death for a murder victim.
- Use DNA gel electrophoresis to compare DNA samples.
- Defend identification of suspect using physical evidence including time of death, cause of death, and DNA crime scene analysis